

**Supplement to the Draft Snake River Salmon Recovery Plan
for Southeast Washington**

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**Prepared by
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DISCLAIMER

Under the Endangered Species Act of 1973 (ESA), the goal of a recovery plan is the conservation and survival of a threatened or endangered species. Recovery plans are prepared by the National Marine Fisheries Service (NMFS), consistent with the agency's obligations under the ESA, often with the assistance of recovery teams, contractors, state agencies, and others. Recovery plans are not regulatory or decision documents—that is, the recommendations in a recovery plan are not considered final decisions unless and until they are actually proposed for implementation. Objectives will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Nothing in this Plan should be construed as a commitment or requirement that any Federal agency obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. 1341, or any other law or regulation. Recovery plans do not necessarily represent the views, official positions, or approval of any individuals or agencies, other than those of NMFS, and they represent the official positions of NMFS only after they have been approved by the NMFS Northwest Regional Administrator, after giving notice of a proposed Plan and opportunity for public comment. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery actions.

1 INTRODUCTION

The Endangered Species Act of 1973 (ESA) requires the National Marine Fisheries Service (NMFS) to develop recovery plans for species listed under the Act. The purpose of recovery plans is to identify actions needed to restore threatened and endangered species to the point where they are again self-sustaining elements of their ecosystems and no longer need the protections of the ESA.

NMFS believes it is critically important to base ESA recovery plans for salmon on the many state, regional, tribal, local, and private conservation efforts already underway throughout the region. Local support of recovery plans by those whose activities directly affect the listed species, and whose actions will be most affected by recovery requirements, is essential. NMFS' approach to recovery planning has therefore been to support and participate in locally led collaborative efforts to develop recovery plans, involving local communities, state, tribal, and Federal entities, and other stakeholders. As the lead ESA agency for salmon and steelhead, NMFS is responsible for reviewing these salmon and steelhead recovery plans.

To be approved by NMFS, an ESA recovery plan must meet certain requirements prescribed by the ESA; it must describe specific management actions, establish objective, measurable criteria for delisting, and estimate the time and cost to carry out measures needed to achieve recovery [listed in ESA section 4(f)(1)(B) and discussed further in Section 3 of this document]. To aid locally developed plans in meeting or contributing to these requirements, NMFS writes a "supplement," summarizing the plan and noting any necessary additions or qualifications. Information contained in the supplement is then used to modify the locally developed plan.

This is a supplement to the Draft Snake River Salmon Recovery Plan for Southeast Washington, which the Snake River Salmon Recovery Board (SRSRB) submitted to NMFS in October 2005. The SRSRB Plan includes a separately bound summary and a more detailed technical document. (see http://www.snakeriverboard.org/pdf_files/TechDoc_102405_complete.pdf, or http://www.snakeriverboard.org/pdf_files/Summary_102505.pdf.) Together, the SRSRB Plan and the Supplement make up a draft interim regional recovery plan.

The SRSRB Plan addresses five listed ESUs under NMFS' jurisdiction: Snake River spring/summer Chinook salmon and Snake River fall Chinook salmon (*O. tshawytscha*); Snake River sockeye salmon (*O. nerka*); Middle Columbia River steelhead and Snake River steelhead (*Oncorhynchus mykiss*). The SRSRB Plan also addresses bull trout (*Salvelinus confluentus*) in the Columbia River distinct population segment (DPS), which are under the jurisdiction of the U.S. Fish and Wildlife Service and are therefore not discussed further in this Supplement. All the species are listed as "Species of Concern" by the State of Washington.

The Snake River spring/summer Chinook and fall Chinook salmon ESUs were listed as threatened (57 FR 14658, April 22, 1992; correction 57 FR 23458, June 3, 1992). The Snake River sockeye salmon was listed as endangered November 20, 1991 (56 FR 58619). NMFS reaffirmed the threatened status of the Snake River spring/summer and fall Chinook ESUs, and the endangered status of the Snake River sockeye ESU, on June 28, 2005 (70 FR 37160).

The Snake River steelhead ESU was listed as threatened on August 18, 1997 (62 FR 43937). The Middle Columbia River steelhead ESU was listed as threatened on March 25, 1999 (64 FR 14517). Recently, NMFS revised its species determinations for West Coast steelhead under the ESA, delineating steelhead-only DPSs. The former steelhead ESU included both the anadromous steelhead and resident, non-anadromous, rainbow trout. The steelhead DPS does not include rainbow trout, which are under the jurisdiction of USFWS. NMFS listed both the Snake River and Middle Columbia River steelhead DPSs as threatened on January 5, 2006 (71 FR 834). The Federal Register Notice contains a more complete explanation of this listing decision.

To avoid confusion in this Supplement, and with regard to the SRSRB Plan, which was written before the DPS listing decision was posted, we ask the reader to understand that references to "ESU viability criteria" or "ESU-level plans, considerations, etc." imply the steelhead DPS as well. Also, since both salmon ESUs and steelhead DPSs are considered to be "species," as defined in Section 3 of the ESA, we may refer to "species-level" plans, implying both ESU and DPS.

The Southeast Washington Salmon Recovery Region does not encompass the entire range of any one of the ESUs or DPSs; therefore, ultimately this plan will be combined with other local and regional plans to construct overall plans for the affected species. NMFS expects this draft interim regional recovery plan to contribute to meeting the ESA section 4(f) recovery plan requirements as part of the ESU/DPS-level plans.

The SRSRB was formed in 2002 under Washington State statute to oversee and coordinate salmon and steelhead recovery efforts in the Lower Snake River region of southeastern Washington. It comprises representatives from county governments, the Confederated Tribes of the Umatilla Indian Reservation, irrigation districts, private landowners, and concerned citizens. The SRSRB's mission is to protect and restore salmon habitat, consistent with the recovery plan, for current and future generations.

The SRSRB Plan is an extensive document developed to meet multiple obligations, including state and Federal requirements. It describes recovery goals, habitat strategies, and actions to support the tributary component (the habitat factor) for recovery of populations in the Washington portion of the Snake River. It provides direction for addressing limiting factors and threats within an adaptive management framework. NMFS will address the factors other than habitat, including hydropower system operations, harvest, and hatcheries, in the subsequent ESU-level plans.

This Supplement contains the following components: the Northwest regional context for the SRSRB Plan; background and overview of the SRSRB Plan, including the process by which it was developed; a discussion of how the SRSRB Plan contributes to ESA recovery plan requirements; and a description of NMFS' intended use of the SRSRB Plan. After a 60-day public comment period, the SRSRB intends to revise its plan according to the Supplement and the public comments, in a process closely coordinated with NMFS.

1.1 Recovery Domains and Technical Recovery Teams

NMFS designated five geographically based recovery domains for preparing recovery plans for listed salmon species in the Northwest. Washington State's Snake River Salmon Recovery Region falls into NMFS' Interior Columbia domain. The other domains are Puget Sound, the Willamette/Lower Columbia, Oregon Coast, and Southern Oregon/Northern California Coast. For each domain, NMFS appointed an independent Technical Recovery Team (TRT) to develop recommendations on biological viability criteria for ESUs and populations of salmon and steelhead, to make technical findings regarding limiting factors, to provide scientific support to local and regional recovery planning efforts, and to provide scientific evaluations of recovery plans. The TRT for the Interior Columbia (the ICTRT) includes biologists from NMFS, Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game, U.S. Forest Service, Columbia River Inter-Tribal Fish Commission, U.S. Fish and Wildlife Services, University of Montana, and the University of Washington.

NMFS' intent in establishing TRTs for each domain was to seek unique geographic and species expertise for evaluating viability and identifying factors limiting recovery. Nonetheless, each TRT is working from a common scientific foundation. All the TRTs have used the same biological principles for developing their ESU and population viability criteria. These principles are described in a NMFS technical memorandum, *Viable Salmon Populations and the Recovery of Evolutionarily Significant Units* (McElhany et al., 2000). Viable salmonid populations (VSP) are defined in terms of four parameters: abundance, population productivity or growth rate, population spatial structure, and life history and genetic diversity. The TRT defines a viable ESU as naturally self-sustaining. Each TRT's recommendations are assessed using the VSP framework and are based on data availability, the unique biological characteristics of the ESUs and habitats in the domain, and the members' collective experience and expertise.

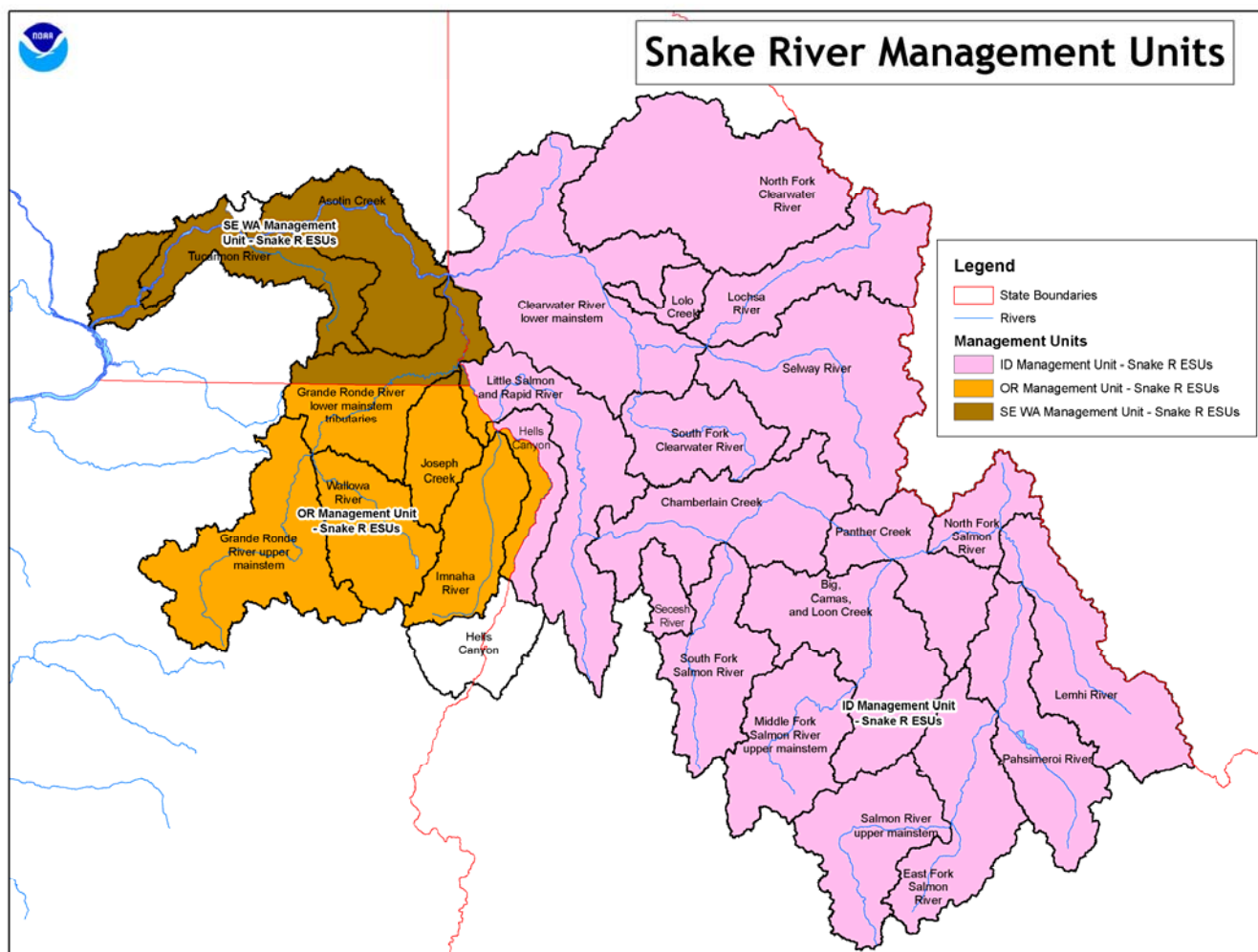
In each domain, NMFS is also working with state, tribal, local, and other Federal stakeholders to develop a planning forum appropriate to the domain, one that builds to the extent possible on ongoing, locally led efforts. The role of these planning forums is to use the TRT reports and other technical products to agree on recovery goals and limiting factors assessments, then to develop locally appropriate and locally supported recovery actions needed to achieve recovery goals. While these forums also are working from a consistent set of assumptions regarding needed recovery plan elements, the process by which they develop those elements, and the form they take, may differ among domains.

1.2 Management Units and ESU/DPS-Level Recovery Plans

The SRSRB Plan encompasses the Lower Snake Mainstem, Walla Walla, Tucannon, and Asotin subbasins in the State of Washington, in which 4 of the 28 extant populations of the Snake River spring/summer Chinook salmon ESU are found. The SRSRB Plan also includes the Washington portions of the Walla Walla and Grande Ronde subbasins, within which 4 of the 25 populations of the Snake River steelhead DPS and 2 of the 17 populations of the Middle Columbia River steelhead DPS are found. Sockeye salmon migrate through the recovery region, but spawn and rear higher in the Snake Basin. The fall Chinook population is described but not evaluated in the recovery plan because the ICTRT had not completed the viability curve for fall Chinook at the time the draft plan was written. That viability curve will be included in the next draft of the SRSRB Plan.

None of the ESUs or DPSs is entirely contained within the Washington Snake River Salmon Recovery Region. Because most state and local boundaries are not drawn on the basis of watersheds or ecosystems, the various groups and organizations formed for recovery planning do not necessarily correspond to ESU areas. Therefore, in order to develop ESU-wide recovery plans that are built from local recovery efforts, NMFS defined “management units” that roughly follow jurisdictional boundaries but, taken together, encompass the geography of entire ESUs. The Interior Columbia domain has three sub-domains: Upper Columbia, Middle Columbia, and Snake. Two of these sub-domains, the Middle Columbia and Snake, have multiple management units. For Middle Columbia River steelhead, there are four management units: 1) Oregon; 2) Yakima; 3) Columbia Gorge (Klickitat/Rock Creek/White Salmon); and 4) Southeast Washington (Walla Walla and Touchet). For the Snake River sub-domain there are three management units (Figure 1): 1) Idaho; 2) Oregon; and 3) Southeast Washington. The SRSRB Plan is the plan for the Southeast Washington Management Unit of both sub-domains, which corresponds to the Snake River Recovery Region of Washington State.

Figure 1. Snake River management units



In 2006, the separate management unit plans will be “rolled up” or consolidated into ESU-level recovery plans. Roll-up will involve participation by the SRSRB, along with representatives from the other management units and other appropriate representatives from habitat, hydropower, harvest, and hatchery interests (all “H” sectors). ESU-level interdependencies, such as recovery criteria, population scenarios, out-of-subbasin effects, all-H life cycle analyses, and research, monitoring, and evaluation strategies, will be addressed during roll-up. In each of the sectors, it is anticipated that participants will describe and agree to an integration of their individual recovery actions into ESU-level recovery actions for the various ESUs. The final ESU-level recovery plans will incorporate the management unit plans and endorse the recommendations and decisions (for example, decisions on site-specific habitat actions) that are most appropriately left to the local recovery planners and implementers. The ESU-level plans will also more completely address actions for the hatchery, harvest, and hydro sectors.

1.3 Tribal Trust/Treaty Responsibilities

In the case of listed salmon and steelhead, considerations in addition to the ESA are also important. Snake River and Middle Columbia River salmon and steelhead and all of the other listed ESUs/DPSs have historically been harvested, and there is a strong public interest in restoring them to harvestable status. Because listed fish often migrate with non-listed fish, the listings have become factors limiting the harvest of both.

Northwest Indian tribes have legally enforceable treaty rights reserving to them a share of the salmon harvest. Achieving the basic purpose of the ESA (to bring the species to the point where they no longer need the protection of the Act) may not by itself fully meet these rights and expectations, although it will lead to major improvements in the current situation. Ensuring a sufficient abundance of salmon to sustain harvest can be an important element in fulfilling trust and treaty rights as well as garnering public support for these plans.

Thus, it is appropriate for recovery plans to take these considerations into account and plan for a recovery strategy that includes harvest. In some cases, increases in the naturally spawning populations may be sufficient to support harvest. In others, the recovery strategy may include appropriate use of hatcheries to support a portion of the harvest. So long as the overall plan is likely to achieve the biological recovery of the listed ESU/DPS, it will be acceptable as a recovery plan.

1.4 NMFS Public Process

NMFS partnered with the SRSRB in the recovery planning process to encourage local participation in development of the SRSRB Plan. NMFS is publishing a Notice of Availability of the SRSRB Plan and concurrently posting this Supplement and requesting comments on both documents for 60 days. Upon completion of the 60-day public review process (in late March or early April 2006), NMFS will compile all comments received and meet with the SRSRB, the Washington Governor’s Salmon Recovery Office (GSRO), and others as appropriate to consider the necessary revisions to the SRSRB Plan based on the Supplement and public comments. All comments received by the date specified will be considered prior to NMFS’ decision whether to endorse the SRSRB Plan, including the Supplement, as an interim regional recovery plan. NMFS will provide a summary of the comments and responses through its regional web site (www.nwr.noaa.gov) and provide a news release for the public announcing the availability of the

response to comments. NMFS has agreed to share all comments received as a result of this process with the SRSRB. Our intent is to assist the SRSRB in updating its plan and to continue a collaborative relationship with the SRSRB in the adoption and use of its plan as an interim regional recovery plan. NMFS will work with the SRSRB to incorporate this interim regional recovery plan into proposed species-level ESA recovery plans for the respective recovery domains.

2 BACKGROUND AND OVERVIEW OF THE PLAN

The SRSRB Plan reflects the region's strong commitment to its threatened salmonid populations. Citizens of this area consider recovery of salmonids to be highly desirable. Salmon, steelhead, and bull trout are valuable in many ways to the people of the region. They are harvested in commercial (outside the region) and recreational (inside and outside the region) fisheries as well as taken for tribal ceremonial purposes. Native Americans place great value on salmonids as a religious, nutritional, economic, and cultural resource. The salmon is omnipresent in the culture of regional tribes and is still treated ceremonially in the recovery region, as it has been for thousands of years. The salmon is also an enduring symbol of the Pacific Northwest for non-Native peoples. For many people who will never catch a salmon, it is important to know that salmon are still present in Northwest rivers and streams as an indication of high environmental quality and as a symbol of regional identity.

Washington counties encompassed by the recovery region include: Asotin, Columbia, part of Franklin, Garfield, Walla Walla, and part of Whitman. The largest cities and towns in the recovery region include Walla Walla, College Place, Pullman, Clarkston, Dayton, Pomeroy, and Asotin. One of the SRSRB's priorities is to facilitate support for salmonid habitat protection and restoration activities among taxpayers, landowners, civic groups, and businesses.

The SRSRB initiated the recovery planning process in February 2004. Operating through an extensive public process, they established several committees to aid planning efforts, including the Executive Committee, the Budget Committee, and the Lead Entity Project Review and Ranking Committee. They also appointed a Regional Technical Team (RTT) to review and provide technical and scientific input to the recovery effort. Members of the RTT are from the following organizations: Confederated Tribes of the Umatilla Indian Reservation; Governor's Salmon Recovery Office; Washington Department of Ecology; U.S. Army Corps of Engineers; U.S. Forest Service, U.S. Fish and Wildlife Service, and the Nez Perce Tribe. The SRSRB promoted public involvement through open SRSRB meetings, public workshops, press releases, a speaker's bureau, public displays, and a website www.snakeriverboard.org.

Since salmon recovery planning is part of a larger array of planning taking place within the region, the SRSRB Plan builds upon other regional plans. Many of these plans have similar broad goals and objectives, facilitating coordination and communication across planning efforts. Thus, the SRSRB Plan is based primarily on the subbasin plans developed by local entities in partial response to the Northwest Power and Conservation Council's Fish and Wildlife Program. In addition, master plans and comprehensive plans developed by communities, as well as land and water use plans for communities and counties, may also affect the SRSRB Plan by defining what can and cannot be done to lands and water within certain geographic areas.

The SRSRB completed the first phase of the planning process in June 2005. The Board completed additional work on its plan in a "transition phase," and this version of the plan was submitted to GSRO in October 2005. This iteration of the SRSRB Plan lays the foundation for recovery actions over the next 15 years. It is expected that, as new information becomes available, changes will be made to the SRSRB Plan.

2.1 The SRSRB Plan's Goals

The following vision statement for the SRSRB Plan reflects statements from the subbasin plans for the Lower Snake River Mainstem (Pomeroy Conservation District 2004), Tucannon River (Columbia Conservation District 2004), Asotin Creek (Asotin County Conservation District 2004), and Walla Walla River (Walla Walla Watershed Planning Unit et al. 2004):

Develop and maintain a healthy ecosystem that contributes to the rebuilding of key fish populations by providing abundant, productive, and diverse populations of aquatic species that support the social, cultural, and economic well-being of the communities both within and outside the recovery region.

The SRSRB defined salmon recovery "at two levels: recovery and restoration. The SRSRB defines recovery as meeting ESA de-listing requirements based on VSP criteria. . . The goal of restoration is defined as attainment of conditions that provide increased harvest opportunity for local communities and tribes, thereby meeting trust and treaty rights, as well as fisheries mitigation objectives for mainstem dams" (Section 5.1, p. 215 of the SRSRB Plan).

Section 5.4 of the SRSRB Plan identified "restoration goals" proposed by various agencies for specific populations. Unlike recovery goals, restoration goals do not incorporate a relationship between productivity and abundance and often do not specify a productivity value at all. Generally, restoration goals are abundance targets for a specific population or production area and often specify the number of both naturally produced and hatchery-origin fish that comprise the total abundance population. The SRSRB Plan's Table 5-12 summarizes the restoration goals. A harvest goal is also specified for some populations.

2.2 Current ESU Status

All the salmon and steelhead that are the subjects of the SRSRB Plan are listed under the ESA as threatened, except the sockeye salmon, which are endangered. Section 3 of the SRSRB Plan provides maps showing the known and presumed presence of the key species. It provides tables showing the major population groupings and their component populations as identified by the ICTRT, as well as a definition and list of major and minor spawning areas (MSAs and mSAs) identified by the ICTRT. Section 3 also includes life history information, historical populations, and current abundance, productivity, and distribution for the Washington portion of the various ESUs and DPSs.

2.3 Threats and Limiting Factors

The reasons for a species' decline are generally analyzed in terms of limiting factors and threats. Limiting factors are defined as the biological conditions limiting population productivity. Threats are defined as those human activities or naturally induced actions that cause the limiting factors. The SRSRB Plan examines the general threats and limiting factors for Lower Snake River

salmon recovery in Section 4. After identifying threats to recovery, the SRSRB Plan describes specific recovery strategies and measures that will be used to guide actions at the watershed level to mitigate the threats.

2.3.1 Habitat

Section 4.4.1 of the SRSRB Plan discusses the habitat factors affecting Lower Snake River salmon and steelhead populations. The watersheds in the recovery region have similar salmonid habitat limitations because of similarities in topography, geology, vegetation, and land use. Agriculture (including grazing), logging, and urbanization have resulted in increased sediment and water temperatures, decreased riparian condition, and caused major changes in channel form and function, resulting in lack of habitat diversity, increased channel instability, and low flows (see Table 8 of the Summary). The SRSRB used the Ecosystem Diagnosis and Treatment model (EDT) to identify limiting habitat factors.

2.3.2 Hydropower

Section 4.4.2 of the SRSRB Plan summarizes the Lower Snake hydroelectric system factors affecting Snake River salmon and steelhead. The Lower Snake River recovery region contains four major dams on the Lower Snake River: Lower Granite, Little Goose, Lower Monumental, and Ice Harbor. Thus, depending on the locations of their native streams, adult and juvenile migrants must pass some or all of these dams as they migrate through the Lower Snake River, as well as the four dams on the Lower Columbia River. Fish headed for Asotin Creek and the Grande Ronde River pass all four Snake River dams and reservoirs, Tucannon River fish encounter two, and Walla Walla origin fish do not pass any mainstem Snake River dams. All migrants must pass four Columbia River dams. All of the Lower Snake River dams have juvenile bypass systems as well as ladders for adult upstream passage. In-river migrants may pass through juvenile bypass systems, spillways, or turbines, all of which can inflict mortality on the migrants. Juvenile migrants arriving at the Lower Snake River dams may also be collected, transported by barge or truck, and released below Bonneville Dam.

Passage through the hydroelectric system, both adult passage upstream and juvenile passage downstream, has major effects on populations within the recovery region. While there are facilities to aid fish passage at all mainstem Snake River dams below Hells Canyon Dam, the negative effects on populations have not been entirely eradicated. Other negative effects of the hydroelectric system include predation on juveniles by other species in tailraces and reservoirs, dissolved gas bubble disease, entrapment and entrainment on/in mechanical portions of the dam (such as turbines), altered water temperatures, adult fallback, and alteration of normal migration rates.

2.3.3 Harvest

The SRSRB Plan reviews the history and effects of harvest in Section 4.4.4. The SRSRB Plan's Appendix B contains a detailed discussion of in-region and out-of-region harvest and applicable regulations. In-region fisheries include recreational fisheries for salmon and steelhead authorized by Washington, Oregon, and Idaho, and treaty Indian ceremonial and subsistence fisheries. From

1977 to 2000, the Washington Department of Fish and Wildlife (WDFW) did not allow sport fisheries for salmon in the region. Since 2001, WDFW has authorized limited selective fisheries for spring/summer Chinook salmon in late April, May, and June. These fisheries are managed to stay within the overall harvest rate allowed for all non-treaty fisheries for Snake River and Columbia River spring/summer Chinook salmon under the US v. Oregon Columbia River Fish Management Plan. Catches of wild fish and impacts on them are relatively low.

2.3.4 Hatcheries

The SRSRB Plan reviews the benefits and potential hazards and risks posed by hatchery operations in Section 4.4.3. Hatchery programs directly affecting Snake River populations include programs funded under the Lower Snake River Compensation Program, those funded by Idaho Power Company, and other programs. In 2002, 33 hatcheries from throughout the basin released over 29 million juvenile salmon and steelhead into the Snake River. The SRSRB Plan states that a major concern is the high stray rate of Umatilla-origin hatchery fish into the mainstem Snake River and subbasins within the recovery region. Interbreeding of hatchery and wild fish may reduce the viability of the wild component of the run.

The SRSRB Plan states that there is some indication that the presence of hatchery adults on the spawning grounds may decrease wild fish fitness and survival. Over the last 30 years, at least small numbers of hatchery adults and juveniles have been observed in virtually all stream reaches within the recovery area. NMFS and other agencies are reviewing and assessing hatchery programs in the Columbia Basin in several different processes. These efforts are expected to provide relevant information to the SRSRB Plan in 2006.

2.3.5 Additional Factors

Sections 4.5 and 4.6 of the SRSRB Plan contain discussions of the following additional factors that affect Snake River salmon and steelhead: habitat alterations in the Columbia River and estuary, conditions in the Pacific Ocean, and dam operations on the Clearwater and Upper Snake mainstem.

2.3.6 All-H Integration

Recovery will depend on the concerted efforts of actions addressing habitat, harvest, hydroelectric operations, and hatcheries working together and adjusting over time as population conditions change. The SRSRB Plan discusses all-H integration in Section 4.5. See Section 3.1.4 of this Supplement for additional discussion of all-H integration.

2.4 The SRSRB Plan's ESU Viability Criteria

Because the Washington Snake River Salmon Recovery Region does not encompass the entire range of any ESU, the SRSRB Plan addresses viability only at the level of the populations and major population groups (MPGs) that are the local components of the corresponding ESUs. The SRSRB Plan acknowledges that setting delisting goals for each ESU is NMFS' responsibility, and focuses instead on the ICTRT's recommendations concerning viability for the local populations and MPGs. ESU-level viability criteria consider the appropriate distribution and characteristics of component populations needed to maintain the ESU over a range of long-term ecological and evolutionary processes.

The ICTRT used the viable salmonid population (VSP) framework, described in a NMFS technical memorandum, *Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units* (McElhany et al., 2000), in considering Snake River salmonids. The VSP framework defines viability in terms of four parameters: abundance, productivity, genetic and life history diversity, and spatial structure. The ICTRT first focused on the relationship between abundance and productivity. Abundance (adults on the spawning ground) and productivity (adult progeny per parent) are inextricably linked, as unproductive populations can still persist if they are sufficiently large, and small populations can persist if they are sufficiently productive. A viable population needs sufficient abundance to maintain genetic health and to respond to normal environmental variation, and sufficient productivity to enable the population to quickly rebound from periods of poor ocean conditions or freshwater perturbations. High productivity allows the population to rebuild production to healthy numbers quickly.

The ICTRT developed viability criteria expressed as graphs showing the relationship between abundance and productivity. The result is a curve, called a “viability curve,” running from high abundance/low productivity to high productivity/low abundance. The ICTRT developed a method for adapting viability curves to reflect estimates of the historical amount of potentially accessible spawning and rearing habitat available to a specific population. They estimated “intrinsic” production potential or capacity for a given habitat and categorized populations as Basic, Intermediate, or Large, based on the intrinsic capacity of their habitat. The actual current abundance and productivity are then plotted against this viability curve. Populations above the curve are considered to have a low risk of extinction and below the curve a higher risk of extinction.

As noted in Section 2.1 of this Supplement, the SRSRB Plan defines its recovery goal as “meeting ESA delisting requirements based on VSP criteria.” The SRSRB Plan adopts the viability criteria recommended for populations within this domain by the ICTRT in 2004 (ICTRT 2004). Section 4 of the plan describes these criteria and the ability of listed populations to meet the targets. In Section 5.1 of the SRSRB Plan Summary, Figures 9 and 10 show general viability curves for populations of the Snake and Middle Columbia steelhead DPSs and spring/summer Chinook ESU. At the time of completion of the SRSRB Plan (June 2005), the ICTRT had not completed a viability curve for fall Chinook in the Washington Snake River Salmon Recovery Region. The three viability figures follow (and are also available at http://www.snakeriverboard.org/pdf_files/Summary_102505.pdf).

The SRSRB adopted the following general spatial structure/diversity planning targets for each subbasin and population:

- Where possible, expand current spawning distributions to match the historic condition as defined by the major spawning aggregations (MSAs) in each subbasin. (The ICTRT defined MSAs as tributary habitat sufficient to support 500 spawners.)
- Develop populations that are separated spatially so that risks due to catastrophic events are reduced.

- The similarity between current and historical patterns of juvenile rearing distribution, habitat usage, and life history types should be increased, insofar as the historical patterns can be reconstructed.

2.5 Strategies and Actions for Recovery

Sections 6 and 7 in the SRSRB Plan describe strategies and actions for achieving recovery of listed salmonid populations in the region.

2.5.1 Strategies

Management strategies to address the limiting factors and threats for each ESU population are identified in Section 6 of the Plan. The SRSRB expects that achievement of the Plan's goals will ultimately lead to the desired future condition as defined by the recovery region's vision statement. The goals will be achieved through actions or sets of actions that will be consistent with the recovery region's strategy.

The SRSRB adopted general strategic guidelines (below) but also made its first priority to be actions to address imminent threats. Imminent threats are conditions that are causing, or are about to cause, fish mortality. Examples of imminent threats include fish passage barriers, unscreened stream diversions, stream fords (low water crossings), and introduction of toxic effluents in areas occupied by fish species of concern.

The following are the SRSRB Plan's strategic guidelines (Summary, p. 39):

1. Emphasis will be placed on projects with long persistence time ("life span") and benefits distributed over the widest possible range of environmental attributes.
2. Recovery/restoration actions must include immediate measures in addition to long-term actions. Many actions that address the root causes of habitat degradation require a long time to achieve their goals. An example would be planting trees in riparian zones to a) reduce instream temperatures, b) add large woody debris, and c) increase habitat complexity. Immediate actions which can "jump start" recovery can include such things as manual addition of large woody debris to stream channels, and creation of meanders in channelized streams.
3. The management strategy will involve "adaptive management"; that is, it will be a feedback system where changes in information or data detected through monitoring and evaluation will be used to adjust and modify plans and actions.
4. Identification of important areas and proposed actions is based substantially on information contained in the applicable subbasin plans.
5. Actions necessary to accomplish the recovery goals will be considered within the context of the four "Hs" (habitat, harvest, hatcheries, and hydroelectric).

Figure 2. Viability curve for Snake River steelhead ESU (ICTRT 2004)

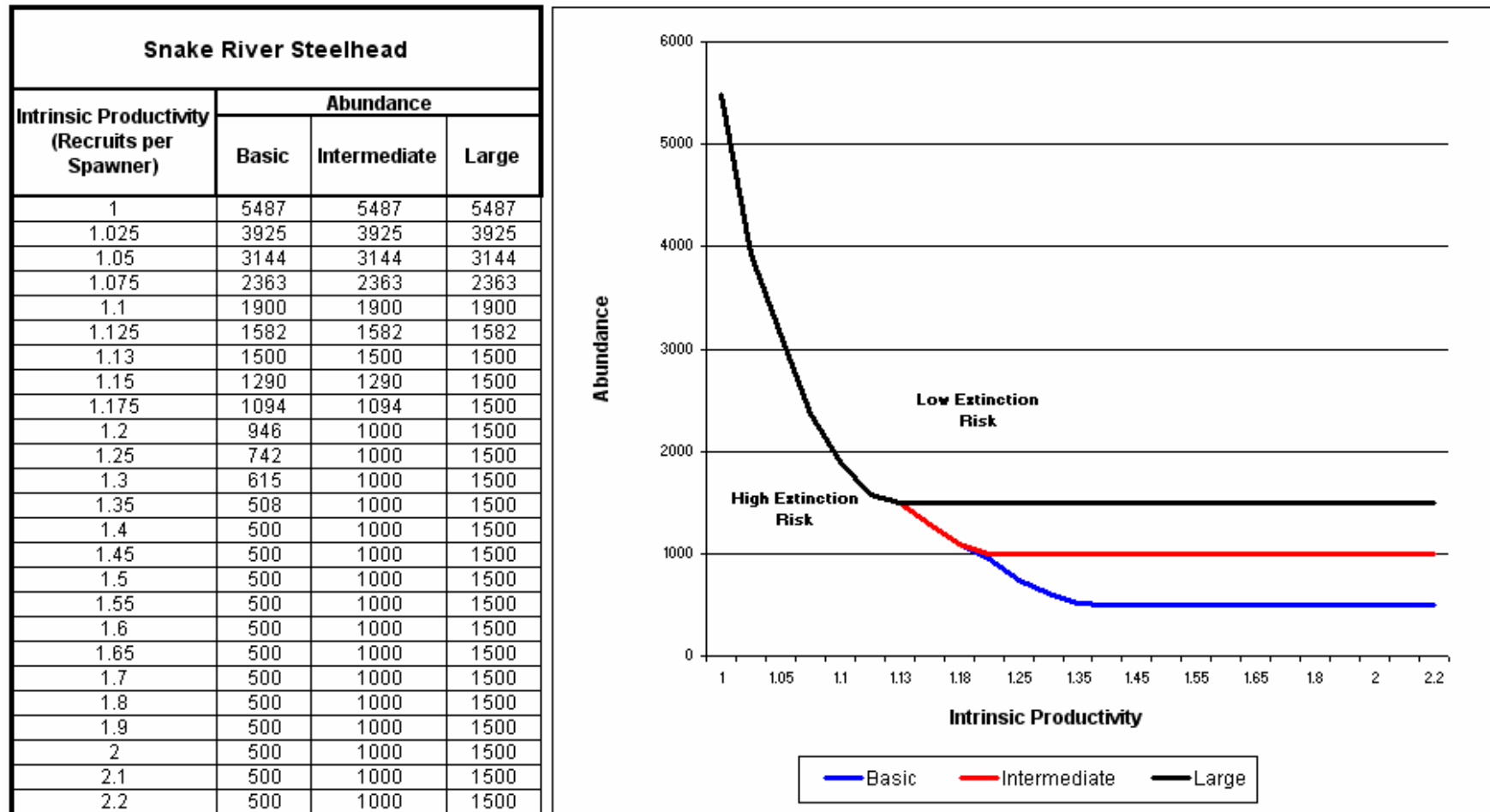


Figure 3. Viability curve for Middle Columbia River steelhead ESU (ICTRT 2004)

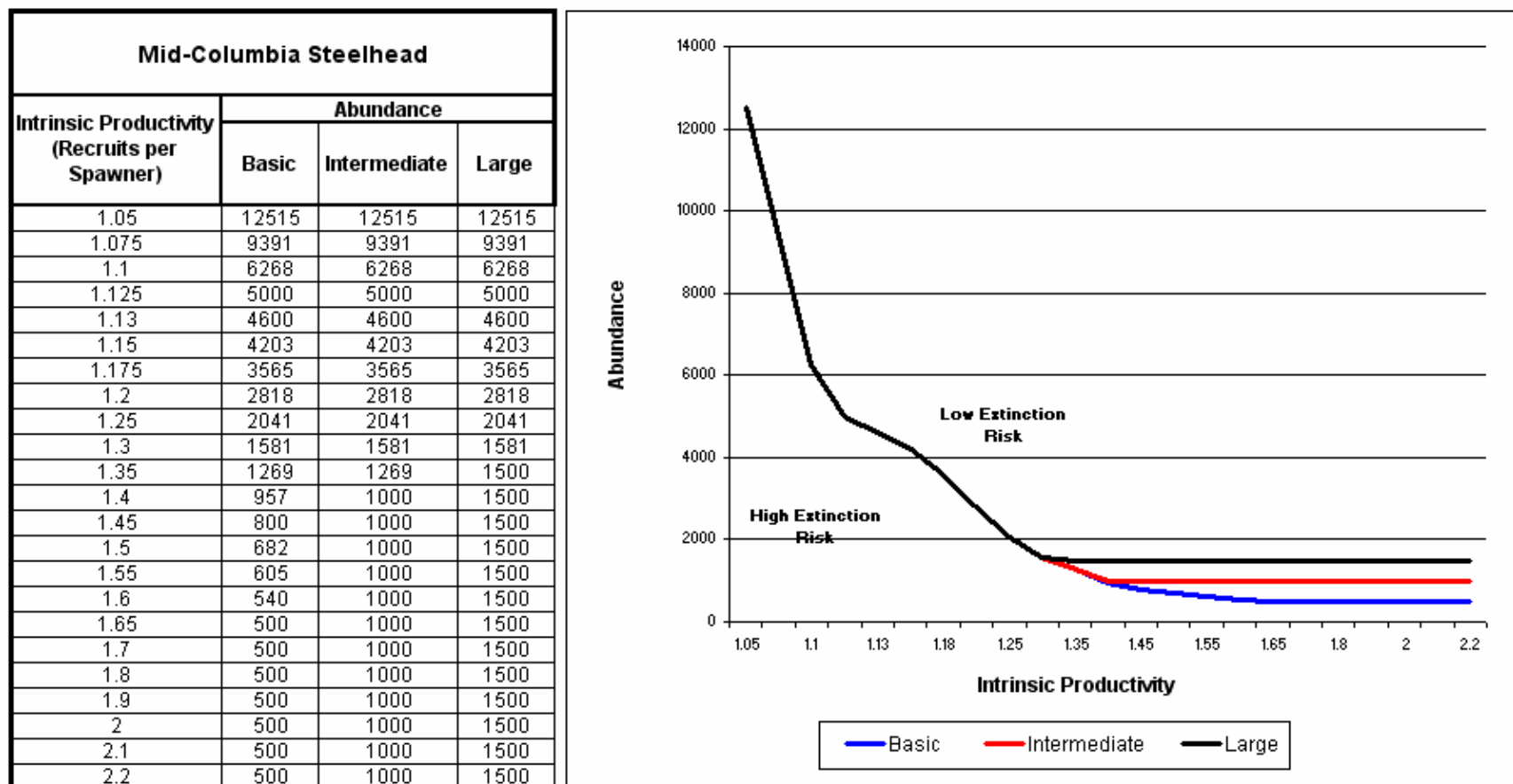
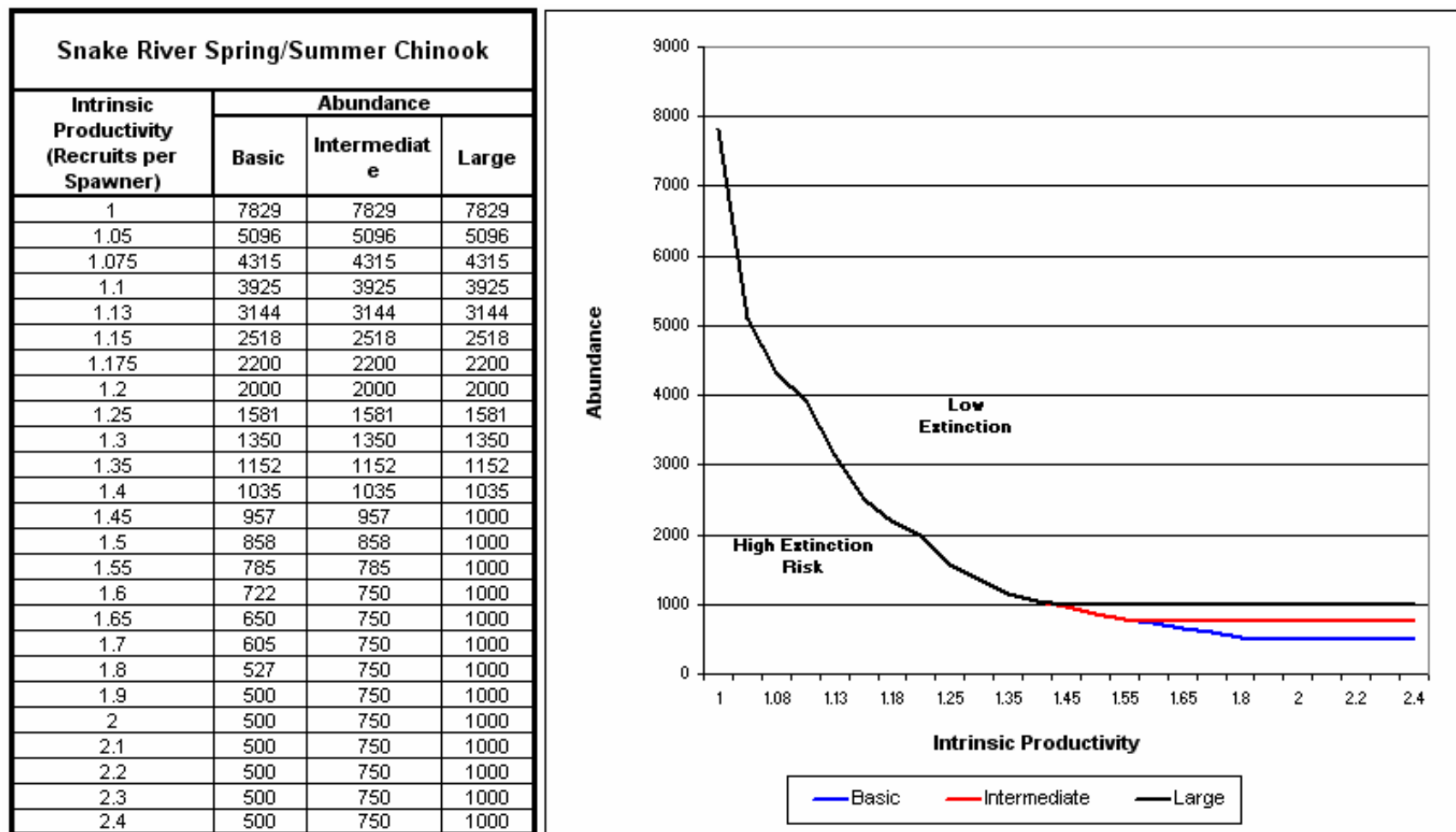


Figure 4. Viability curve for Snake River spring/summer Chinook ESU (ICTRT 2004)



6. Actions implemented within the region will be focused primarily on restoration and protection of habitat; actions pertinent to the other “Hs” will be addressed primarily through other planning processes, but the SRSRB may provide recommendations to these processes.
7. The EDT analysis tool, in combination with other analyses, empirical data and professional opinion, will be used to identify and prioritize habitat actions.
8. The final set of proposed actions will be subject to economic, social, and cultural constraints identified by the recovery region.
9. Priority actions are those which the SRSRB hopes to accomplish over the 15-year life span of this plan.

Sections 6.1 to 6.4 of the SRSRB Plan identify specific strategies for habitat, hydroelectric, hatchery and harvest concerns.

2.5.1.1 Habitat

The habitat strategy is based on protection and/or restoration of habitat. Protection involves preserving high quality or productive habitat; existing habitat conditions are maintained and degradation does not occur. Restoration revitalizes degraded habitat through either passive or active measures.

Habitat protection and restoration areas were prioritized, as follows:

- Removing imminent threats to fish life in areas containing ESA-listed populations.
- Protecting stream reaches currently supporting ESA-listed populations
- Protecting existing reaches of high ESA-listed fish productivity

2.5.1.2 Hydro

Actions to improve juvenile or adult survival through the hydropower system are not proposed as part of this recovery plan. The SRSRB Plan relies on the strategies and actions put forward by NMFS in its 2004 Biological Opinion for the Federal Columbia River Power System (FCRPS) (NMFS 2004c).

2.5.1.3 Hatcheries

The SRSRB Plan supports current state and Federal hatchery strategies that have been incorporated into Hatchery and Genetic Management Plans (HGMPs). (HGMPs are source documents for information about anadromous fish hatcheries. Managers of fish hatcheries, both Federally and privately funded, submit this information to NMFS to satisfy ESA requirements for permits for any operations that affect listed species. HGMPs include proposed measures to support conservation of listed species.) These strategies attempt to balance risks to recovery of listed fish populations with the achievement of harvest objectives. The SRSRB Plan does not

propose any new hatchery actions because these are managed in programs outside the SRSRB, but it does propose a strategy that incorporates integrated and segregated hatchery programs. The SRSRB Plan proposes integrated programs, which use native broodstock to reduce risk of extinction, for most subbasins and populations, while reserving the Wenaha River and Joseph Creek, in the Grande Ronde River subbasin, for natural production only. The SRSRB expects local fisheries managers to develop tributary hatchery management plans in coordination with NMFS.

2.5.1.4 Harvest

The SRSRB Plan does not propose specific harvest strategies, which are managed in other venues.

2.5.1.5 Adaptive Management

The SRSRB emphasizes adaptive management as a fundamental aspect of salmon recovery. The SRSRB Plan's structure acknowledges that adaptive management, research, monitoring, evaluation, and implementation are intertwined in any recovery timeframe or schedule, and they are generally discussed in this mutual context. See Chapter 8.

The SRSRB envisions an extensive adaptive management program being developed in Phase 4 – Implementation of the watershed planning process funded by the State of Washington. Upon its completion, this adaptive management program will be incorporated into the SRSRB Plan. In the meantime, the SRSRB Plan describes the basic elements of such a plan: (1) Establishing performance standards for management actions that correspond to the reach-specific conditions, expressed in terms of equilibrium abundance, productivity, carrying capacity, and life history diversity, proposed as objectives in the recovery plan. (2) Identifying threshold levels that trigger management changes. The SRSRB Plan defines some other challenges and issues:

- Create and fund a coordinating and oversight entity.
- Develop standardized monitoring protocols.
- Develop threshold values for performance standards.
- Collect baseline habitat and fish data and integrate them into the SRSRB Plan.

The SRSRB Plan states that the research, monitoring, and evaluation (RM&E) program for Snake River recovery is being planned in conjunction with Columbia Basin fisheries co-managers and will be available for review in late 2005. An overview of RM&E is shown in Table 20 of the SRSRB Summary. In addition, the SRSRB Plan proposes to establish a Watershed Monitoring Council for the Walla Walla and one for the Snake to coordinate and standardize research and monitoring in the Snake River recovery region.

2.5.2 Actions

Section 7 in the SRSRB Plan describes habitat actions proposed by the SRSRB. The actions are targeted for the major spawning aggregations (MSAs) and are designed to increase productivity, abundance, spatial structure, and diversity by addressing the limiting factors and threats

identified in Section 4. The actions are designed to improve upland habitat, riparian conditions, floodplain functions, instream habitat, water quantity, and water quality. Discussions for the hydroelectric system and harvest are limited, because actions in these “Hs” are generally outside the control of subbasin managers. The hatchery actions discussed in the SRSRB Plan are taken directly from the HGMPs produced by hatchery operators and managers, and thus are not actions independently proposed by the SRSRB.

Table 13 in Section 7 of the SRSRB Plan Summary shows “habitat factors” such as substrate embeddedness, riparian function, and maximum temperature, and indicates “approach categories” for each factor, such as “improve instream habitat,” “improve water quantity,” and “improve channel and floodplain.” Then the approach categories are prioritized; for example, to address the habitat factor of temperature, the first priority is to improve riparian areas, second, to improve water quantity. Table 14 shows priorities and objectives for each MSA; for example, for the Middle Touchet River MSA, the “imminent threats,” which would take first priority, are fish screens, fords, low stream flows, and gravel berms. The temperature objective is to have no more than 4 days above 72°F.

Table 15 in Section 7 of the SRSRB Plan Summary further specifies the actions needed by MSA and assigns cost estimates to each, e.g. to install a sediment basin in the uplands, set dikes back, purchase water rights, and remove imminent threats.

The SRSRB Plan then uses EDT modeling to predict the effects of the proposed actions on the listed fish populations in the recovery area, and notes that because of the assumptions and uncertainties involved in modeling, “the success of the recovery plan will be based not on modeling results, but instead through the development of empirical estimates of fish production obtained from a well-designed monitoring program.” (Summary, p. 58)

Section 7 also includes information on legal and public involvement actions that may be needed to implement the SRSRB Plan or to make the SRSRB Plan more successful. The section concludes with a discussion of the expected change in wild fish performance with plan implementation.

2.6 Implementation

Plan implementation involves taking effective actions on the landscape; addressing data gaps through research, monitoring, and evaluation; establishing schedules; identifying responsibilities; and securing funding. Section 8 identifies actions, monitoring, and programs in the watersheds of the Lower Snake River region. The section does not identify mainstem Snake River actions that are currently being implemented by state, Federal, and tribal entities. Section 8 does, however, include by reference the hydropower system plans and associated programs and actions, monitoring, and review.

An 18-month implementation plan is the centerpiece of the implementation strategy. This plan is discussed in Section 8.2; it proposes actions (listed in Appendix 1 of the SRSRB Plan’s Summary) that were developed by multiple agencies and groups within the recovery region and that can be implemented quickly. Since salmon recovery has been going on in the region since the early 1990s, much of the internal framework (policy, scientific, public support, and funding)

needed to implement these actions is either in place or can be established quickly once the plan is adopted. Actions proposed in this 18-month plan vary from working to eliminate imminent threats to restoring riparian areas. The section also discusses policy, legislation, and scientific “unknowns” that need to be resolved to fully implement the plan.

2.7 Estimates of Time and Costs

In view of the many scientific uncertainties regarding the effectiveness of specific recovery actions, as well as uncertainties regarding funding in the long run, the SRSRB assumes a 15-year life span for this recovery plan. It emphasizes early implementation of high priority actions. The SRSRB proposes implementation of its initial, 18-month plan, which contains actions that can be conducted in the near future to reduce threats to listed fish. The Summary states that early implementation is possible because “salmon recovery has been an ongoing process in the region since the early 1990s. Therefore, a significant portion of the internal framework (policy, scientific, public support, and funding) needed to implement [the SRSRB Plan] is either already in place, or can be established quickly once the plan is adopted” (Summary, p. 63).

Multiple agencies and groups within the recovery region are actively developing salmon recovery actions for implementation in 2006 and 2007. Most of the projects, and especially those already approved by the NPCC, were selected for how well they were coordinated with subbasin plans. Therefore, the actions proposed in 2006 and 2007 are linked to the habitat problems identified in the SRSRB Plan.

Costs associated with the proposed actions for MSAs are contained in Table 15 of the SRSRB Plan. This table summarizes the cost of proposed actions over the 15-year lifetime of the plan. The SRSRB Plan indicates that, exclusive of monitoring and evaluation, implementation planned actions in MSAs will cost approximately \$6.9 million per year or \$103.5 million over the 15-year plan lifetime. Funding sources are discussed in Section 8.2 of the SRSRB Plan. The SRSRB Plan does not include a specific cost estimate for research, monitoring, and evaluation in the plan area. The Summary states that it is estimated that RM&E costs associated with monitoring habitat and fish communities in the recovery area as part of the SRSRB Plan and other processes may be as high as \$6 million per year (\$90 million over 15 years). The plan proposes meetings between the co-managers, NMFS, and USFWS to better define the scale of monitoring. More detailed estimates would follow prioritizing of tasks and expenditures.

2.8 Research, Monitoring, and Evaluation for Adaptive Management

See Section 2.5.1.5 above.

2.9 Public and Scientific Review

The ESA requires public review of draft recovery plans, and NMFS policies (NMFS 2004b) require scientific peer review as well. The ESA does not require that the public be involved in developing the plans. The degree of collaboration in the development of this Plan among Federal, state, tribal, and local entities as well as citizen’s groups and interested individuals has been extensive; nevertheless, in fulfillment of the ESA’s formal review requirements, there will be additional public comment periods before the SRSRB Plan is finalized.

The SRSRB Plan underwent extensive public and scientific review during development and was revised as appropriate in response to the reviews. A description of Plan development and the public involvement program is provided in Section 1.4 of the SRSRB Plan. In addition, the Regional Technical Team appointed by the SRSRB provided technical and scientific review. The RTT reviewed information leading to creation of the SRSRB Plan and worked with the SRSRB to ensure that policies and implementation strategies were based on the best available science. The RTT will continue to be involved in plan implementation, as well as monitoring and evaluation.

Further, the SRSRB recognizes that public involvement is essential for successful plan implementation. It is vital that the public understand the priority areas and actions, as well as the programs and potential policies necessary for salmon recovery, and that they support these projects and programs. This involvement and support will vest the public in this process and allow them to take ownership. It is important for the public to recognize the many planning efforts ongoing across the region and to be assured that these efforts are coordinated and, to the extent possible, consistent. The SRSRB plans to provide coordination and ensure a point of contact for the public.

2.9.1 Snake River Salmon Recovery Board's Public Process

The public has been involved throughout the recovery planning process. (See Section 1.4 of the SRSRB Plan.) Methods through which the public has been involved include: establishment of a website (www.snakeriverboard.org), advertisements, press releases, public displays, SRSRB meetings, public workshops, and a speakers' bureau. The public involvement program, which was conducted in three phases, resulted in hundreds of agency and public comments. The purpose of Phase 1 was to inform the public about the planning process and to receive public input on the first two plan elements: existing conditions and salmonid assessment (Sections 1 and 2). This phase took place between May 2004 and September 2004. Phase 2 began in October 2004 and extended through June 2005. Its purpose was to report to the public on the planning process and to receive public comment on the Draft Snake River Salmon Recovery Plan and Draft Public Summary. Phase 3 or the "transition phase" occurred between July 2005 and October 2005. During the transition phase, additional agency and public comment was obtained on the June 2005 version of the SRSRB Plan.

The website, www.snakeriverboard.org, includes information about the planning process and schedule, and outlines ways in which the public can be involved in the process. It also provides specific information about the planning elements and related planning processes. SRSRB meeting times and locations, SRSRB meeting minutes, drafts of Plan elements, and planning updates were posted on the site. During the planning period, the website received an average of 5,000 hits per month.

Paid advertisements ran in several area newspapers at various times throughout the planning process: *Walla Walla Union Bulletin*, *Waitsburg Times*, *Dayton Chronicle*, *The East Washingtonian*, *Lewiston Tribune*, *Whitman County Gazette*, *The Daily Bulletin*, and the *Moscow-Pullman Daily News*. The advertisements gave an overview of the planning process and informed the public that portions of the SRSRB Plan were available for review. Press releases

aimed at advertising the public workshops were also sent to the newspapers, 19 radio stations, and 4 television stations in the area.

In August and September 2004, public displays were set up at the Columbia and Walla Walla county fairs. The displays provided recovery planning information and information about public workshops related to early stages of the planning process. In addition, brochures about recovery planning were made available to those who passed by the display booths.

SRSRB meetings are held in Dayton, Washington, and are open to the public. The meetings are advertised on the website and approved minutes are posted to the website.

In Phase 1, four public workshops were held in September 2004 in Clarkston, Pomeroy, Walla Walla, and Dayton, Washington. All the workshops were held in the evening with a staffed open house followed by a short Power Point presentation and comment period. These workshops were held to provide general information on the SRSRB Plan and the planning process and to provide the public with an opportunity to ask questions and provide input. Workshops were held in April 2005 in Clarkston, Walla Walla, and Dayton during Phase 2. Specific information was provided about each section of the draft plan, and the public was given an opportunity to comment.

In addition to the workshops, a regional salmon summit was held in March 2005 in Dayton. The purpose of the summit was to update regional stakeholders on the salmon recovery planning process, generate discussion on the draft plan, and provide other entities involved in salmon recovery activities within the region the opportunity to share the results of their efforts.

A “speakers’ bureau” was offered by the SRSRB staff. The staff contacted groups within the planning region that were considered to have a particular interest in the SRSRB Plan. Several of these requested presentations by the SRSRB staff during the early portions of the planning process.

2.9.2 Scientific Review

As in other regional domains defined by NMFS Northwest Region, the Washington Snake River salmon recovery planning effort was supported by a NMFS-appointed science panel, the ICTRT. This panel of ten scientific experts from Federal, state, local, tribal, and academic entities identified independent populations within each ESU as well as viability criteria. The ICTRT defined geographic boundaries for Lower Snake River region salmon populations and provided technical guidance to the SRSRB for use in preparing watershed recovery chapters and regional elements of the SRSRB Plan. The ICTRT technical guidance was reviewed by multiple technical experts from Federal, state, and local agencies and the Umatilla Tribes. The ICTRT’s population identification document (ICTRT July 2005) was reviewed by scientists of NOAA’s Northwest Fisheries Science Center, by Columbia River FCRPS co-managers, and by the Independent Scientific Advisory Board (ISAB) appointed by the Northwest Power and Conservation Council (NPCC) and NMFS.

The NPCC-appointed Independent Scientific Review Panel (ISRP) and the ISAB peer-reviewed the Lower Snake Mainstem, Walla Walla, Tucannon, Asotin and Grand Ronde Subbasin Plans. The development of these subbasin plans were led by the following entities: The Pomeroy

Conservation District for the Lower Snake Mainstem Subbasin; the Walla Walla Basin Watershed Council for the Walla Walla Subbasin; the Columbia Conservation District for the Tucannon Subbasin; the Asotin County Conservation District for the Asotin and the Grande Ronde Model Watershed Foundation for the Grande Ronde Subbasin. Prepared for the Northwest Power and Conservation Council, these plans integrated the perspectives of fish, wildlife, and land managers, including the Nez Perce and Umatilla tribes, local governments, biologists and other scientists, landowners, interest groups, and the general public. After scientific (and public) review, the NPCC adopted these subbasin plans to aid in the restoration fish and wildlife resources, including salmon, in the Columbia River Basin. These subbasin plans were precursors to and important building blocks for the Snake River Salmon Recovery Plan for Southeast Washington.

3 THE PLAN AND ESA REQUIREMENTS

As indicated in Section 1.0 of this Supplement, NMFS' approach to developing salmon recovery plans is to support and participate in locally led watershed and ESU-scale planning efforts. For NMFS to endorse the SRSRB Plan, the SRSRB Plan should contribute to and be consistent with ESA recovery requirements, as follows:

- ESA section 4(f)(1)(B) requirements for a recovery plan (See Section 3.2 of this Supplement for details.)
- ESA section 4(a)(1) factors for re-classification or de-listing (See Section 3.2.2.2 of this Supplement for details.)

The intent of these statutory requirements is to make recovery plans specific and accountable. In addition, NMFS believes it is important to have goals and scientifically supported strategies to provide the public and decision-makers with a clear understanding of the purpose, objectives and recommended approach for recovering a listed species (NMFS 2004b).

Section 3.1 contains NMFS' assessment of and conclusions regarding the SRSRB Plan's overall goal and recovery strategy. Section 3.2 is a summary of how the SRSRB Plan contributes to the ESA section 4(f)(1)(B) requirements, including the ESA section 4(a)(1) factors for re-classification or delisting.

3.1 Recovery Goals and Recovery Strategy

The SRSRB Plan's vision statement, quoted in Section 2.1, provides the context within which recovery goals and planning targets are set and strategies and actions are identified. The SRSRB Plan's vision statement "includes: 1) meeting recovery goals established by NMFS for listed populations of anadromous fish species and by USFWS for bull trout, 2) achieving sustainable harvests of key species within the recovery region and the Columbia River, and 3) realizing these objectives while recognizing that local culture and economies (agriculture, urban development, logging, power production, recreation, and other activities) are beneficial to the health of the human environment within the recovery region" (SRSRB Plan Summary, p. 33). NMFS supports this vision and considers it consistent with ESA recovery planning.

The SRSRB Plan's recovery strategy is summarized in Section 2.5.1 of this Supplement. NMFS supports the overall strategy. In this section we further emphasize, reinforce, or augment particular elements of it to ensure uncertainties are reduced to the maximum extent possible at this time. The overall strategy and the inclusion of the important plan elements listed below are the basis for NMFS' conclusion that the SRSRB Plan has a solid foundation upon which to achieve its goals and contribute to ESU recovery. Elements of the strategy are discussed under the three H-factors (habitat, harvest and hatcheries), adaptive management, and all-H integration.

3.1.1 Habitat

The SRSRB Plan has a good start at describing a tributary habitat recovery strategy. Limiting factors are identified for discrete geographic units using EDT. The important step of defining a process for prioritizing habitat actions (which would address limiting factors) is included in the plan. Also, both protection and restoration measures are addressed.

NMFS agrees with the priorities detailed in the SRSRB Plan. The proposed strategies and actions for habitat protection presented in the SRSRB Plan, if implemented, would increase the likelihood that the plan will lead to recovery of the ESU. Instream flow targets are not proposed as actions in this Plan because they are being addressed in other forums. NMFS agrees with the SRSRB that once flow targets are established, the recovery plan will be updated to include actions designed to achieve them. The SRSRB Plan incorporates descriptions of population tributary habitat areas consistent with ICTRT designations. Potential variations from the TRT recommendations are discussed and justifications for relatively minor changes are provided.

3.1.2 Hatcheries

The SRSRB Plan does not include any new hatchery programs, but it also acknowledges that hatcheries can play an important role in recovering fish populations. NMFS agrees with the approach to artificial propagation described in the SRSRB Plan and will work with the SRSRB and fish managers to ensure that existing hatchery programs support recovery. NMFS and other agencies are reviewing and assessing hatchery programs in the Columbia Basin in several different processes. These efforts are expected to provide relevant information to the SRSRB Plan in 2006. Additional information and guidance for considering the impacts of hatchery supplementation programs on population-level risk is in the ICTRT's draft viability recommendations (ICTRT July 2005). The SRSRB Plan would benefit from expanded discussion of short- vs. long-term hatchery strategies for the populations, recognition of the risks associated with large-scale supplementation efforts, opportunities for reserve areas, and/or for backing off of direct supplementation after a specific time period or as natural stocks respond to recovery actions.

3.1.3 Adaptive Management and Monitoring and Evaluation

The SRSRB Plan emphasizes adaptive management appropriately but does not currently contain an adaptive management program. NMFS will work with the SRSRB and the watershed planning process to support development and implementation of the adaptive management and monitoring program.

NMFS is developing adaptive management guidance for monitoring and evaluation programs for this and other recovery plans. The guidance is based on a decision framework that identifies the

questions that need to be asked to structure a monitoring and evaluation program. The decision framework builds upon (a) the ESU and population viability principles described in McElhany et al. 2000 and associated indicators proposed by the TRTs, and (b) the identified threats limiting population and ESU viability as defined by the five statutory listing factors section 4(a)(1) of the ESA (see Supplement Section 3.2.2.2). The SRSRB Plan's monitoring and evaluation program is consistent with this framework. NMFS will provide a web-accessible link to this document and staff support to help the SRSRB and other regional, state, tribal, and local entities to develop appropriate research, monitoring, and evaluation plans for adaptive management.

3.1.4 All-H Integration

Section 4.5 of the SRSRB Plan discusses the limiting factors in all the H sectors, both within and outside of the recovery region, but does not provide an analysis of how integration of recovery efforts across the Hs could be accomplished. NMFS will work with the SRSRB to advance this analysis during roll-up of the management unit plans for the Middle Columbia steelhead ESU and Snake River ESUs in 2006.

3.2 ESA section 4(f)(1)(B) Requirements

According to section 4(f)(1)(B) requirements of the ESA, recovery plans should incorporate

“a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species; objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list; and estimates of the time required and the cost to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal.”

This section contains a discussion and summary of how the SRSRB Plan contributes to the three section 4(f)(1)(B) requirements (see Section 4.0).

3.2.1 Site-Specific Management Actions

The ESA requires a recovery plan to include site-specific management actions. NMFS believes the SRSRB Plan meets this requirement; the basis for this conclusion is included in this section.

As described in Section 2.5.2 above, habitat actions proposed by the SRSRB are aimed at MSAs and are grouped under “Approach Categories.” These categories define the approach to be taken to implementing strategies (restoration or protection, discussed in Section 6 of the SRSRB Plan) in order to achieve the desired future condition and recovery goals (Section 5 of the SRSRB Plan). These approaches are designed to improve upland habitat, riparian conditions, floodplain functions, instream habitat, water quantity, and water quality. The selected approaches were prioritized using the following criteria (discussed in Section 7 of the SRSRB Plan):

- Effectiveness: What is the probability that implementing this strategy will achieve the objective?
- Technical Feasibility: How feasible is the strategy from a technical perspective?

- Cost/benefit: Are the benefits to fish habitat large relative to the cost of the strategy?

Habitat factors (attributes) are correlated with sets of approaches, each of which is prioritized. Actions to achieve these improvements are defined for each MSA and each habitat factor.

As the SRSRB Plan and its Implementation Schedule notes, NMFS recognizes that additional site-specific actions will need to be or are currently being developed for the MSAs in the Walla Walla, Tucannon, Middle Mainstem Snake, Asotin, and Grande Ronde subbasins, and supports those proposals that are included in the SRSRB Plan for doing so.

NMFS agrees with the SRSRB Plan's approach that as implementation and adaptive management proceeds, proposed actions in each watershed will be further refined and prioritized for implementation in a manner that specifically addresses the primary factors limiting recovery.

NMFS strongly supports the importance of testing hypotheses about limiting factors through adaptive management and monitoring. As plan implementation and adaptive management unfolds, NMFS will continue to work with the SRSRB to ensure that priorities for implementing recovery actions at the regional or ESU level continue to be set in a manner that is consistent with the major limiting factors for the ESU. Further, NMFS agrees with the strategic guidelines in Section 6.2 of the SRSRB Plan and listed in Section 2.5.1 of this Supplement.

NMFS concludes that the SRSRB Plan contributes to the first of the 4(f) requirements for a recovery plan: it has a description of site-specific management actions, inclusive of the above qualifications and emphases, necessary to achieve the plan's goal for the conservation and survival of the species.

3.2.2 Objective, Measurable Criteria

Evaluating a species for potential delisting requires an explicit analysis of population or demographic parameters (the biological recovery criteria) and also of threats under the five ESA listing factors in ESA section 4(a)(a). Together these make up the "objective, measurable criteria" required under section 4(f)(1)(B).

3.2.2.1 Biological Recovery Criteria

As described in Section 2.4 of this Supplement and Sections 4 and 5 of the SRSRB Plan, the SRSRB Plan proposes population-level viability criteria for abundance and productivity for Washington Snake River populations that are consistent with the 2004 ICTRT recommendations (ICTRT 2004). The SRSRB Plan, however, defers to NMFS to establish delisting criteria at the ESU level. The ESU is the unit upon which NMFS will base any decision to remove the ESU from the list of threatened and endangered species.

The ICTRT organized its consideration of the viability of the affected ESUs into three levels—the ESU, the population, and an intermediate level, called a major population grouping (MPG) (ICTRT 2004). MPGs are groups of populations that share similarities within the ESU. They are defined on the basis of genetic, geographic (hydrographic), and habitat considerations (McClure

et al. 2003). In its 2004 report, the ICTRT recommended criteria for determining viability at each level, and updated these criteria in July 2005.

Section 4.1 of the SRSRB Plan has a good summary of the population level VSP criteria recommended by the ICTRT in 2004. However, the SRSRB Plan states on p. 143: “To be considered viable in terms of abundance and productivity, a population must lie above the viability curve matching its intrinsic size.” This statement needs to be clarified. A point above the curve represents a 5 percent or less risk of extinction within 100 years. A point below the curve represents more than a 5 percent risk of extinction, but not an absolute lack of viability. The basis of the viability curves is level of risk of extinction, not ability to survive in an absolute sense.

The viability curves are based on population models, and the modeling also takes into account varying levels of certainty of outcome. When NMFS reviews the status of the ESUs at 5- and 10-year intervals, it must take into account not only levels of estimated risk, but also estimated levels of certainty and other considerations.

In the ICTRT’s July 2005 report (Viability Criteria for Application to Interior Columbia Basin Salmonid ESUs) at http://www.nwfsc.noaa.gov/trt/col_docs/viabilityupdatememo.pdf, the ICTRT revised its recommendations for both MPG- and ESU-level viability criteria, raising the standard for some populations to “highly viable” — less than 1 percent risk of extinction within 100 years. This standard has proven controversial. SRSRB and NMFS are considering the ICTRT’s recommendations.

The SRSRB Plan does not contain specific recovery goals for spatial structure and diversity for the populations in the Southeast Washington Management Unit, because, as stated on p. 228, a method of combining several independent VSP parameters to develop an integrated risk level for either spatial structure or diversity had not yet been developed when the Plan was being written. In addition, the SRSRB Plan states that some of these VSP criteria require information, such as historical demographic and genetic characteristics, that is currently not available or may never be available. The ICTRT has completed an evaluation of spatial structure and diversity for Southeast Washington populations and NMFS will work with the SRSRB to help them respond to this evaluation.

NMFS endorses the population-level viability criteria recommended by the SRSRB Plan on an interim basis, pending the completion of ESU-level criteria and the development of recovery scenarios for the ESU. The recovery scenarios will describe a target status and risk level (probability of persistence) for each population within the ESU and how many and which populations need to be at a particular status for the ESU to have an acceptably low risk of extinction. The development of the recovery scenarios will be a combined policy and technical effort. These ESU-level criteria and scenarios will be incorporated into ESU-wide Snake River salmon and steelhead and Middle Columbia steelhead ESU-level recovery plans. NMFS will continue to work with the SRSRB to address the effect of ESU-level criteria on the populations within the SRSRB management unit.

These criteria represent the best scientific analysis with most current understanding of the populations and ESUs at this time. As the recovery plan is implemented, additional information will become available, along with new scientific analyses that can increase certainty about whether the threats have been abated, whether improvements in population and ESU status have occurred for Middle Columbia steelhead and Snake River salmon and steelhead, and whether linkages between threats and changes in salmon status are understood. These recovery criteria and the factors for delisting will be assessed through the adaptive management program under development for the SRSRB Plan, and NMFS will thoroughly review the criteria at the 5- and 10-year status reviews of the ESUs.

Salmon and steelhead populations within the Washington Snake River management unit make up only a portion of the total Snake River and Middle Columbia ESUs. Therefore, even if the populations and major population groupings within this management unit meet recovery objectives and criteria, the determination of whether the ESUs are recovered will take into account the status and risk levels of all the component MPGs and populations.

NMFS concludes that it can endorse the SRSRB Plan's biological recovery criteria on an interim basis – until plans for the entire Snake River salmon and steelhead and Middle Columbia ESUs are approved -- and with the addition of more specific descriptions of spatial structure and diversity criteria.

3.2.2.2 Listing Factor (Threats) Criteria

Listing factors are those features that were evaluated under section 4(a)(1) when the initial determination was made to list the species for protection under the ESA. These may or may not still be limiting recovery when in the future NMFS reevaluates the status of the species to determine whether the protections of the ESA are no longer warranted and the species could be delisted. At the time of a delisting decision, NMFS will examine whether the section 4(a)(1) listing factors have been addressed. To assist in this examination, NMFS will use the listing factors (or threats) criteria described below in addition to biological recovery criteria.

The five listing factors (or threats) described in section 4(a)(1) of the ESA are the following:

- A. The present or threatened destruction, modification, or curtailment of [the species'] habitat or range
- B. Over-utilization for commercial, recreational, scientific or educational purposes
- C. Disease or predation
- D. The inadequacy of existing regulatory mechanisms
- E. Other natural or manmade factors affecting its continued existence

NMFS proposes that, to determine that the affected ESUs are recovered to the point that they no longer require the protections of the ESA, the above listing factors should be addressed according to the specific criteria identified for each of them (below) so that de-listing is not likely to result in re-emergence of the threat. It is possible that current perceived threats will become insignificant in the future as a result of changes in the natural environment or changes in the way threats affect the entire life cycle of salmon. Consequently, NMFS expects that the

ranking of threats will change over time and that new threats may be identified. During the status reviews, NMFS will evaluate and review the listing factor criteria under conditions at the time.

The specific criteria listed below for each of the relevant listing/de-listing factors help to ensure that underlying causes of decline have been addressed and mitigated prior to considering a species for de-listing.

Factor A: Present or threatened destruction, modification, or curtailment of a species' habitat or range

To determine that the ESUs are recovered, threats to habitat should be addressed as outlined below:

1. Passage obstructions (e.g., dams and culverts) are removed or modified to improve survival and restore access to historically accessible habitat where necessary to support Middle Columbia River steelhead recovery goals as described in the SRSRB Plan.
2. Flow conditions and instream flow targets that support adequate steelhead rearing, spawning, and migration are achieved through management of mainstem and tributary irrigation and hydropower operations, and through the improvement of other water user efficiencies and conservation, including for municipal supply and other consumptive purposes.
3. Forest management practices that protect watershed and stream functions are implemented on Federal, state, tribal, and private lands.
4. Agricultural practices, including grazing, are implemented to protect and restore riparian areas, floodplains, and stream channels, and to protect water quality from sediment, pesticide, herbicide, and fertilizer runoff.
5. Urban and rural development, including land use conversion from agriculture and forestland to urban areas, does not reduce water quality or impair natural stream conditions.
6. The effects of toxic contaminants on salmonid fitness and survival in mainstem rivers and tributaries are sufficiently limited so as not to affect recovery.
7. Channel function, including vegetated riparian areas, canopy cover, stream-bank stability, off-channel and side-channel habitats, natural substrate and sediment processes, and channel complexity is restored to provide adequate rearing and spawning habitat.
8. Floodplain function and the availability of floodplain habitats for salmon are restored to a degree sufficient to support viable ESUs. This restoration should include connectedness between river and floodplain and the restoration of impaired sediment delivery processes.

For additional information on current threats resulting from habitat degradation and loss, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

Factor B: Over-utilization for commercial, recreational, scientific, or educational purposes

To determine that the ESUs are recovered, any utilization for commercial, recreational, scientific, or educational purposes should be managed as outlined below:

1. Fishery management plans for salmon ESUs are in place that (a) accurately account for total fishery mortality (i.e., both landed catch and non-landed mortalities) and constrain mortality rates to levels that are consistent with achieving ESU viability (i.e., provide for adequate spawning escapement given their productivity); and (b) are implemented in such a way as to avoid deleterious genetic effects on populations or negatively affect the distribution of populations.
2. Fishery rules and regulations are effectively enforced.
3. Technical tools accurately assess the effects of the harvest regimes so that harvest objectives are met but not exceeded.
4. Handling of fish is minimized to reduce indirect mortalities associated with education or scientific programs.

For additional information on threats related to harvest actions, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

Factor C: Disease or predation

To determine that the ESUs are recovered, any disease or predation that threatens their continued existence should be addressed as outlined below:

1. Hatchery operations do not subject steelhead populations to deleterious diseases and parasites and do not result in increased predation rates of wild fish.
2. Predation by avian predators is managed in a way that promotes recovery of salmon and steelhead populations.
3. The northern pike minnow fishery is managed to reduce predation on steelhead as appropriate to meet recovery goals.
4. Populations of introduced smallmouth bass and catfish are managed such that competition or predation does not impede steelhead recovery.
5. Physiological stress and physical injury that may cause disease or increase susceptibility to pathogens during rearing or migration should be reduced during critical low flow periods (e.g. low water years) or poor passage conditions (e.g. at diversion dams or bypasses).

For additional information on current threats resulting from disease or predation, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

Factor D: The inadequacy of existing regulatory mechanisms

To determine that the ESUs are recovered, any inadequacy of existing regulatory mechanisms that threatens their continued existence should be addressed as outlined below:

1. Adequate resources, priorities, regulatory frameworks, and coordination mechanisms are established and/or maintained for effective enforcement of land and water use regulations that protect and restore habitats, and for the effective management of fisheries.
2. Habitat conditions and watershed functions are protected through land-use planning that guides human population growth and development.
3. Habitat conditions and watershed function are protected through regulations that govern resource extraction such as timber harvest and gravel mining.
4. Habitat conditions and watershed functions are protected through land protection agreements as appropriate, where existing policy or regulations do not provide adequate protection.
5. Regulatory, control, and education measures to prevent additional exotic species invasions are in place.

For additional information on existing regulatory mechanisms, see Section 8.2.1 of the SRSRB Plan's Summary.

Factor E: Other natural or manmade factors affecting its continued existence

To determine that the ESUs are recovered, other natural and man-made threats to their continued existence should be addressed as outlined below:

1. Hatchery programs are being operated in a manner that is consistent with individual watershed and region-wide recovery approaches; appropriate criteria are used for the integration of hatchery populations and extant natural populations inhabiting watersheds where the hatchery fish return.
2. Hatcheries operate using appropriate ecological, genetic, and demographic risk containment measures for (1) hatchery-origin adults returning to natural spawning areas, (2) release of hatchery juveniles, (3) handling of natural-origin adults at hatchery facilities, (4) withdrawal of water for hatchery use, (5) discharge of hatchery effluent, and (6) maintenance of fish health during their propagation in the hatchery.
3. Mechanisms are in place to reduce the incidence of, and impacts from, introduced, invasive, or exotic species.
4. Nutrient enrichment programs must be evaluated to determine where additional nutrient inputs can provide significant benefits.

5. Water operations management in mainstem rivers and tributaries maximize survival of juvenile rearing, emigrating smolts and immigrating and spawning adults.

For additional information on other threats, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

3.2.3 Application of the Criteria to Delisting Decisions

In accordance with our responsibilities under section 4(c)(2) of the Act, NMFS will conduct status reviews of Snake River salmon and steelhead and Middle Columbia steelhead at least once every five years to evaluate the ESUs' status and determine whether any ESU should be removed from the list or changed in status. Such evaluations will take into account the following:

- The biological recovery criteria and listing factor (threats) criteria described above
- Principles laid out in the Viable Salmonid Populations paper (McElhany et al., 2000)
- Best available information on population and ESU status and new advances in risk evaluation methodologies
- Considerations consistent with the VSP paper and the ICTRT's recommendations, including: the number of viable populations; the number and status of other extant populations; the distribution of viable populations relative to the range of historical conditions supporting viable populations; linkages and connectivity among viable populations; the diversity of life history and phenotypes expressed; and considerations regarding catastrophic risk
- Principles laid out in NMFS' Hatchery Listing Policy (70 FR 37204, June 28, 2005) (NMFS 2005a)

The biological (Section 3.2.2.1) and listing factor (threats) criteria (Section 3.2.2.2), when taken together, describe conditions, commitments, and administrative measures that, when met, would result in a determination that the species is not likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

3.2.4 Time and Cost Estimates

ESA section 4(f)(1)(B)iii requires that a recovery plan include "estimates of the time required and the cost to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal" (16 U.S.C. 1533 (f)(1)(B)iii).

NMFS agrees that the 15-year span of the SRSRB Plan is a reasonable period of time during which to implement and evaluate the actions identified in the plan to gain a preliminary view of the status and trends of important recovery indicators and make mid-course corrections as needed. However, the SRSRB must clarify that recovery plans need to remain in place until the ESU is recovered; they cannot simply stop at 15 years, regardless of the species' status. Also, the SRSRB should develop a cost estimate for its monitoring and evaluation program, in coordination with the other management units, within the first 18 months of implementation.

NMFS strongly supports the SRSRB Plan's intention to conduct additional economic analyses during the adaptive management process over time and use these in realigning priorities as appropriate. NMFS encourages regional leaders to address additional funding issues as results and progress become apparent in the next 15 years.

3.2.5 Implementation schedule

NMFS supports the SRSRB's 18-month implementation plan, which is based on actions developed by multiple agencies and groups within the recovery region that can be implemented quickly. NMFS encourages the Board to develop its research, monitoring, and evaluation plan, to continue its level of effort and coordination within the region, and to continue working on the "unknowns." NMFS encourages regional leaders to address additional funding issues as results and progress become apparent in the next 15 years and to bear in mind that recovery could take more or less than 15 years.

3.2.6 ESA section 4(f) conclusion

NMFS concludes that the SRSRB Plan, if implemented, would contribute to and be consistent with ESA section 4(f) requirements for a recovery plan. We will incorporate this local product, after its revisions in response to this Supplement and public comment, into final ESA recovery plans.

4 NMFS' INTENDED USE OF THE PLAN

As a result of the evaluation of the SRSRB Plan presented in Sections 2.0 and 3.0, and after considering public comment on the SRSRB Plan, NMFS intends to endorse this plan as an Interim Regional Recovery Plan for the Washington Snake River Management Unit.

As noted above, NMFS prefers to rely on locally developed recovery plans to the extent possible. By endorsing a locally developed recovery plan, NMFS is making a commitment to implement the actions in the SRSRB Plan for which we have authority, to work cooperatively on implementation of other actions, and to encourage other Federal agencies to implement plan actions for which they have responsibility and authority. We will also encourage the State of Washington to seek similar implementation commitments from state agencies and local governments.

As indicated in Section 1.2 of this Supplement, the Washington Snake River Salmon Recovery Region corresponds to NMFS' Southeast Washington Snake Management Unit. The management units were designed to accommodate the local groups and organizations formed for recovery planning, and to ensure that the ESU-wide recovery plans would be built from local recovery efforts. In the process called "roll-up" or consolidation, representatives from the management units and other appropriate representatives from habitat, hydropower, harvest, and hatchery interests (all "H" sectors) will be involved in identifying the ESU-level needs. ESU-level interdependencies, such as ESU-level recovery criteria, population scenarios, out-of-subbasin effects, all-H life cycle analyses, and research, monitoring, and evaluation strategies, will be addressed during roll-up. The final ESU-level recovery plans in each domain will incorporate the management unit plans in a manner that is consistent with our legal mandate to recover listed species.

NMFS intends to work with the Federal agencies to develop an agreement for cooperative implementation of Federal funding programs, including the Bonneville Power Administration's Fish and Wildlife Program and NMFS' Pacific Coast Salmon Recovery Fund (PCSRF).

NMFS expects this plan, and other plans developed throughout the Northwest Region, to help NMFS and other Federal agencies take a more consistent approach to future section 7 consultations. For example, the SRSRB Plan will provide greater biological context for the effects that a proposed action may have on the listed ESU. This context will be enhanced by adding recovery plan science to the “best available information” for ESA section 7 consultations. Such information includes viability criteria for the ESU and its independent populations; better understanding of and information on limiting factors and threats facing the ESU; better information on priority areas for addressing specific limiting factors; and better geographic context for where the ESU can tolerate different levels of risk. Recovery plans will also help focus funding and other efforts on priority areas and issues and will improve cost effectiveness by identifying priorities and by implementing credible adaptive management frameworks.

4.1 ESA-Related Decision-Making

Recovery plans provide context and a technical foundation for NMFS decisions. NMFS will use completed plans to:

- Ensure an integrated approach to ESA section 7 consultations across all “Hs.”
- Judge the significance of proposed actions relative to the importance of the affected habitat and population to ESU survival and recovery.
- Guide and expedite ESA section 7 consultations, Habitat Conservation Plan approvals, section 4(d) rules, and permitting applications for proposed actions consistent with recovery plans.
- Evaluate the degree to which a proposed action is consistent with an applicable recovery plan in making ESA determinations.
 - Proposed actions that are consistent with an applicable recovery plan are more likely to be approved.
 - Proposed actions that are inconsistent with an applicable recovery plan will have an additional burden to demonstrate that they are nonetheless consistent with a no-jeopardy determination.

4.2 Priority Setting

- Recovery plans help focus funding and other efforts on priority areas and actions that must be done first to achieve recovery. NMFS has provided guidance to states and tribes that actions for PCSRF need to be consistent with recovery plans (NMFS 2005b).
- NMFS will prioritize permitting for actions implementing recovery plans and for actions that are consistent with recovery plans.

- Recovery plans will improve cost effectiveness by identifying priorities and by setting up credible adaptive management frameworks.

4.3 Best Available Science

In some instances, there may be science other than that provided in the draft SRSRB Plan that may be applicable to addressing specific recovery issues. Therefore, NMFS will consider all the information available in evaluating plan implementation and performance and assessing risk of actions to listed Snake River salmon and steelhead. NMFS is committed to working with local watershed planning groups during these reviews to share and gain information and perspectives so that plan implementation efforts across the subbasin can improve over time.

4.4 Improvements and Changes Incorporated Over Time

NMFS supports the SRSRB Plan and implementation of all its actions but expects that in response to public comments received on the SRSRB Plan and through the adaptive management process, additional Plan actions, or clarifications of existing actions, may be incorporated over time. These specific improvements have been identified in this Supplement and should be undertaken, as follows:

- Clarify that recovery plans need to remain in place until the ESU is recovered; they cannot simply stop at 15 years, regardless of the species' status.
- Develop a cost estimate for the monitoring and evaluation program, in coordination with the other management units, within the first 18 months of implementation.
- Organize limiting factors and key actions found in various tables and sections of the SRSRB Plan in a way that allows them to be viewed in the context of prioritizing recovery actions.
- Update to include actions designed to achieve instream flow targets once flow targets are established. NMFS will work with the SRSRB to accomplish this task.
- Expand discussion of short- vs. long-term hatchery strategies, risks associated with large-scale supplementation efforts, and opportunities to withdraw direct supplementation after a specific time period or as natural stocks respond to recovery actions.
- Provide an adaptive management and monitoring program. NMFS will work with the SRSRB and the watershed planning process to support adaptive management program development and implementation.
- Develop a cost estimate for the monitoring and evaluation program.
- Change the size category of Wenaha spring Chinook from basic to intermediate to be consistent with ICTRT criteria.

- Be prepared to respond to the completion of ESU-level criteria and the development of recovery scenarios for the ESU.
- Update and apply the criteria for spatial structure and diversity so that there is a clear understanding of where the populations are now with respect to those criteria, where they need to be to be considered viable, what the primary limitations to viability are and the strategies to get there.
- Incorporate the listing factor (threats) criteria in Section 3.2.2.2 of this Supplement into the SRSRB Plan.
- Integrate the following tables of limiting factors and key actions at the population level.

Table 1 identifies the limiting factors and key actions at the population level and therefore is a general characterization at that geographic scale. As an example, the subsequent table narrows the search down by listing the limiting factors and actions at the MSA scale for one MSA—Touchet Steelhead.

Table 2 is an example for organizing key habitat factors by action for an MSA. NMFS expects similar tables will be developed for each MSA.

Table 1. Limiting factors and key actions at population level

ESU: Middle Columbia River Steelhead		
<i>Major Population Grouping: Umatilla/Walla Walla</i>		
Populations	Limiting Factor	Key Actions
Walla Walla	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Large Woody Debris	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD
	Riparian Function	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Stream Flow	Irrigation efficiency, lease water, develop water storage systems, shallow aquifer recharge, develop/protect wetlands
Touchet	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Riparian Function	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Large Woody Debris	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Stream Flow	Irrigation efficiency, lease water, develop water storage systems, shallow aquifer recharge, develop/protect wetlands

ESU: Snake River Steelhead		
<i>Major Population Grouping: Lower Snake Mainstem Tributaries</i>		
Populations	Limiting Factor	Key Actions
Tucannon River <ul style="list-style-type: none"> • Penawawa Creek • Alkali Flat Creek • Deadman Creek • Meadow Creek • Palouse River 	Riparian Function	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Large Woody Debris	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
Asotin Creek <ul style="list-style-type: none"> • Almota Creek • Tenmile Creek • Steptoe Creek • Couse Creek • Alpowa Creek • Wawawai Creek 	Large Woody Debris	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD
	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Bed Scour	Modify stream geometry, set levees back, remove levees
	Riparian Function	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization, continue CREP, implement direct seed, reforest timberlands
<i>Major Population Grouping: Grande Ronde/Imnaha</i>		
Lower Grande Ronde tributaries <ul style="list-style-type: none"> • Wenaha River • Rattlesnake Creek 	Stream Flow	No actions are identified because low flows are attributed to natural conditions. Actions to improve uplands and riparian zone should improve stream flow slightly
	Habitat Diversity	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD and promote diverse habitat conditions

ESU: Snake River Steelhead		
<i>Major Population Grouping: Lower Snake Mainstem Tributaries</i>		
Populations	Limiting Factor	Key Actions
<ul style="list-style-type: none"> • Bufford Creek • Grouse Creek • Menatchee Creek • Bear Creek • Cottonwood Creek • Deer Creek 	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
Joseph Creek	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Habitat Diversity	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD and promote diverse habitat conditions
	Stream Flow	Irrigation efficiency, lease water, develop water storage systems, shallow aquifer recharge, develop/protect wetlands
ESU: Snake River Spring/Summer Chinook		
<i>Major Population Grouping: Lower Snake River Mainstem Tributaries</i>		
Tucannon	Riparian Function	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Large Woody Debris	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization

ESU: Snake River Steelhead		
<i>Major Population Grouping: Lower Snake Mainstem Tributaries</i>		
Populations	Limiting Factor	Key Actions
Asotin	Large Woody Debris	Restore and protect riparian zone, place LWD in stream, modify stream geometry to retain LWD
	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Bed Scour	Modify stream geometry, set levees back, remove levees
	Riparian Function	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization, continue CRP, implement direct seed, reforest timberlands
<i>Major Population Grouping: Grande Ronde/Imnaha</i>		
Grande Ronde	Habitat Diversity	The vast majority of spring Chinook spawning and rearing in the Grande Ronde occurs outside Washington so the Snake River Plan did not develop actions for Oregon.
	Stream Flow	
Wenaha River	Habitat Diversity	Protect existing conditions to promote natural improvement
	Substrate Embeddedness	Protect existing conditions to promote natural improvement
	Large Woody Debris	Protect existing conditions to promote natural improvement
Joseph Creek	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Water Temperature	Restore and protect riparian zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Habitat Diversity	Modify stream geometry, set levees back, remove levees, install LWD and bioengineered habitat
ESU: Snake River Fall Chinook		
<i>Major Population Grouping: Snake River and tributaries</i>		
Snake River	Harvest	The Snake River did not identify actions for fall Chinook because the tributary actions
	Estuary	

ESU: Snake River Steelhead		
<i>Major Population Grouping: Lower Snake Mainstem Tributaries</i>		
Populations	Limiting Factor	Key Actions
	Habitat Diversity	for spring/summer Chinook and steelhead will address the limiting factors for fall Chinook where they currently spawn in the Tucannon, Asotin and Grande Ronde. The remaining spawning/rearing occurs in the mainstem so the plan defers to the BiOp on mainstem operations / actions and to the harvest managers for harvest actions.
	Stream Flow	
	Substrate Embeddedness	
	Habitat Diversity	

Table 2. Key habitat factors and actions by MSA

ESU: Middle Columbia River Steelhead			
Major Grouping: Umatilla/Walla Walla			
Population: Touchet			
MSA: Upper Touchet			
Key Habitat Factor	Habitat Objective	Prioritized Strategy	Identified Actions (15 yrs)
Water Temperature	< 5 days above 72 C	Improve Riparian Areas	Implement 300 acres of new CREP or CREP-like
			Enroll 300 acres in conservation easement
			Exclude livestock at 30 "sites"
			Stabilize 7,500 feet of streambank with new geometry, soft bank stabilization and bioengineered techniques
		Improve Water Quantity	Protect/Develop 12 acres of wetland
			Develop new water storage (sites are not yet identified in this MSA)
			Recharge shallow aquifer at 15 sites
			Implement 75 acres of irrigation efficiency
			Lease/purchase 9 CFS
		Improve Channel and Floodplain	Modify 8 miles of channel geometry

ESU: Middle Columbia River Steelhead			
Major Grouping: Umatilla/Walla Walla			
Population: Touchet			
MSA: Upper Touchet			
Key Habitat Factor	Habitat Objective	Prioritized Strategy	Identified Actions (15 yrs)
		Function	Install bioengineered instream habitat at 75 sites
			Set 3000 feet of levees back
			Add 6,000 lineal feet of LWD
Riparian Function	Avg 72% of historic extent and function	Improve Riparian Areas	(Actions listed above under the “Improve Riparian Areas” strategy)
		Improve channel and Floodplain Function	(Actions listed above under the “Improve Channel and Floodplain Function” strategy”)
		Improve Water Quantity	(Actions listed above under the “Improve Water Quantity” strategy”
Large Woody Debris	2 pieces per channel width	Improve Channel and Floodplain Function	(Actions listed above under the “Improve Channel and Floodplain Function” strategy)
		Improve Riparian Areas	(Actions listed above under the “Improve Riparian Areas” strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the “Improve Channel and Floodplain Functions” strategy.
Channel Confinement	< 25% of streambank length	Improve Channel and Floodplain Function	(Actions listed above under the “Improve Channel and Floodplain Function” strategy”)
		Improve Riparian Areas	(Actions listed above under the “Improve Riparian Areas” strategy)

5 ACRONYMS

CREP	Conservation Reserve Enhancement Program (of US Dept. of Agriculture)
CRP	Conservation Reserve Program
DPS	Distinct Population Segment
ESA	Endangered Species Act
EDT	Ecosystem Diagnosis and Treatment model
ESU	Evolutionarily Significant Unit
FCRPS	Federal Columbia River Power System
GSRO	(Washington) Governor's Salmon Recovery Office
HCP	Habitat Conservation Plan
HGMP	Hatchery and Genetics Management Plan (submitted to NMFS by anadromous fish hatchery managers)
ICTRT	Interior Columbia Technical Recovery Team (appointed by NMFS)
ISRP	Independent Scientific Review Panel (appointed by NPCC)
ISAB	Independent Scientific Advisory Board (appointed by NMFS and NPCC)
LWD	Large Woody Debris
MPG	Major Populations Groups
MSA	Major Spawning Aggregation – Defined by the ICTRT as a tributary system of one or more branches that contain sufficient habitat to support 500 spawners.
mSA	Minor Spawning Area – Defined by the ICTRT as contiguous production area capable of supporting between 50 and 500 spawners.
NMFS	National Marine Fisheries Service (also called NOAA Fisheries)
NPCC	Northwest Power and Conservation Council
PCSRF	Pacific Coast Salmon Recovery Funding
RM&E	Research, Monitoring & Evaluation
RTT	Regional Technical Team (of the SRSRB)
SRSRB	Snake River Salmon Recovery Board
TRT	Technical Recovery Team (appointed by NMFS for each recovery domain)
USFWS	U.S. Fish and Wildlife Service
VSP	Viable Salmonid Population
WDFW	Washington Department of Fish and Wildlife

6 REFERENCES

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